



## INSECT MONITORING AND CONTROL\*

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**\*Compiled from High Plains Integrated Pest Management Guide**

### Cutworms

Weather is known to have a dramatic impact on cutworm populations, as well as many other pests. Dry weather favors cutworm population whereas wet weather can reduce cutworm population by causing mortality of the small larvae. There seems to be a lot of cutworm activity right now in small grains and alfalfa. Our two species, the army and pale western cutworm have a little different life cycle. The army cutworms tend to hatch and develop earlier than the pale westerns.

**Army Cutworm** larvae are nearly two inches long when fully grown, generally colored light gray with lighter markings and pale stripes running down the back. Larvae feed on above ground plant parts so feeding damage can be determined by examining plants. They avoid sunlight so they will be hard to find on sunny days when they will stay in soil, but on cloudy days you may be able to spot them on plants. Damage is often found only in spots in fields and sometimes is more common in drier areas of the field. Infestations can also be field wide. Feeding causes small holes in grain leaves and may cause foliage to turn white. In alfalfa newly seeded fields are most susceptible to cutworm damage. Cutworms may cut the alfalfa plants off at the soil surface. Plants fed on by army cutworms can recover if the army cutworm population is treated to prevent continued depletion of plant reserves.

**Pale Western Cutworms** larvae are subterranean soft-bodied caterpillars, grayish-white in color, unmarked by spots or stripes, with two vertical brown bars on the front of the head capsule. The pale westerns feed below ground, cutting through wheat stems, so their damage may not be apparent until warm conditions cause damaged plants to desiccate. Individuals of these species are more damaging than army cutworms because their damage cannot be recovered from and the stand is lost. Larvae hatch in the spring and remain below ground before they emerge. Examine stand carefully and watch for losses due to cutworms.

**The economic threshold for control of both army and pale western cutworms is when larval cutworms counts exceed 4-5 cutworms per square foot in cereal crops, 3-4 / ft<sup>2</sup> in mature alfalfa stands, and 2 / ft<sup>2</sup> in new alfalfa stands.**

Army and pale western cutworm treatments options for wheat include:

Warrior IEC 1.92-2.56 oz/A; Restrictions include 30 days prior to harvest for grain. Do not apply more than 0.48 pts/A per season.

Lorsban 4E-SG 1 pt/A; Restrictions include 28 days to grain, 14 days to grazing or feeding, and limited to a maximum of 1 pt/A per season. Control may be reduced under temperatures greater than 80° F, under dry conditions, and when larvae are more than ½ inch long.

Treatment options for wheat and barley include:

Thiodan 3EC 2/3qt/A. Aerial application with diesel fuel. Restrictions include no application after heads begin to form, do not feed treated forage to livestock, not more than 2 applications per year and not more than 1.0 lb ai/A/yr.

Treatment options for alfalfa include Ambush 2E, Lorsban 4E, Pounce 3.2E, and Sevin (see labels for rate, preharvest intervals, and remarks).

### **Alfalfa Weevil**

All producers who have grown alfalfa have had experience with alfalfa weevil. Weevil larvae are about 1/20 inch long when they first hatch. They are pale green, and are curved with shiny black heads. A white stripe running down the middle of the back may be visible and becomes more distinctive as the larva matures. At this stage a 10X-hand lens is necessary to identify the weevil larvae. Fully grown larvae are up to 3/8 inch long and are wider in the midsection than either end of the body.

Stem terminals can be heavily damaged by larvae feeding in the folded leaves, but initial damage is not always clearly visible. The closed, overlapping foliage of the stem terminals should be unfolded to detect feeding damage. Heavily infested stands have a grayish or frost-like appearance due to the dried defoliated leaves.

Table X-1 (below) shows how much yield reduction for the first and second hay crop can be expected for various infestation levels (average number of larvae per stem) when alfalfa is up to 15 inches in height. Control measures should be considered when weevil populations increase to a point at which economic loss due to yield reduction is expected to exceed management costs.

Table X-1. Alfalfa Weevil expected yield loss, in tons per acre, for first and second hay cuttings on alfalfa up to 15 inches tall, based on densities of alfalfa weevil larvae per stem.\*

Larvae per stem	First Cutting	Yield Loss (tons per acre) second cutting	Total Loss
0.00	0	0	0
0.5	0.042	0.035	0.077
0.75	0.063	0.052	0.115
1.0	0.084	0.069	0.153
1.25	0.105	0.087	0.192
1.5	0.126	0.104	0.23
1.75	0.147	0.121	0.268
2.0	0.168	0.139	0.307
2.25	0.189	0.156	0.345
2.5	0.21	0.173	0.383
2.75	0.231	0.191	0.422
3.0	0.252	0.208	0.46
3.25	0.273	0.225	0.498
3.5	0.294	0.243	0.537
3.75	0.315	0.26	0.575
4.0	0.336	0.277	0.613
4.5	0.378	0.312	0.69
5.0	0.42	0.347	0.767
5.5	0.461	0.381	0.842
6.0	0.503	0.416	0.919
6.5	0.545	0.451	0.996
7.0	0.587	0.485	1.072
7.5	0.629	0.52	1.149
8.0	0.671	0.555	1.226

\*Adapted from "Alfalfa Integrated Management in Oklahoma," Oklahoma State University. The 'total' column should be used if two or more cuttings are expected. These data should be used as a general guide, and modifications should be made as site-specific

information is gathered. For those wishing to calculate more specific value, data were derived from the following equations: first harvest yield loss = larvae per stem x 0.0839; second harvest loss = larvae per stem x 0.06935; total loss = first harvest loss + second harvest loss.

There are several good insecticides that are excellent at controlling alfalfa weevil. Two relatively new ones are Warrior 1E and Baythroid 2EC. Warrior 1E rates range from 2.56 to 3.84 oz/A and Baythroid 2EC rates range from 1.6-2.8 oz per acre. Both of these are restricted use products. The Extension Office can supply a full list of products available for weevil treatment.

### **Russian Wheat Aphid**

Russian Wheat Aphid is a dusty pale green colored aphid with short antennae and reduced cornicles or tailpipes and a second tail like appendage on the tip of the abdomen. RWA can infest winter wheat, other spring grains, and also a number of cool-season grasses, especially the wheatgrasses. RWA can be found in winter wheat, usually on the younger leaves, from emergence in the fall to grain ripening. Aphid feeding prevents young leaves from unrolling. RWA colonies are found within the tubes formed by these tightly curled leaves. This not only makes it difficult to achieve good insecticide coverage, but also interferes with the ability of predaceous insects to reach and attack the aphids. Leaves infested by RWA have long white, purple or yellowish streaks. Under some conditions, infested wheat tillers have a purplish color. After flowering, some heads are twisted or distorted and have a bleached appearance. Heads often have a “fish hook” shape caused by awns trapped by tightly curled flag leaves.

The threshold for treatment of RWA depends on the plant stage and the level of infested tillers. The table below outlines when treatment should be applied.

<b>Plant Stage</b>	<b>Level of Infestation</b>
Up to Early Boot	15-20% Damaged & Infested Tillers
Boot to Early Flowering	20-25% Damaged & Infested Tillers
After Flowering	More than 25% Damaged and Infested Tillers

An alternative formula to determine whether or not it is economical to treat RWA is:

$$\frac{\text{Control Costs Per Acre} \times 200}{\text{Expected Crop Value Per Acre}}$$

If you have a higher percent infestation than the number derived above, you will make more money treating the aphids than not treating them. After heading use a factor of 500 rather than 200 in the numerator.

At the late dough to early milk stage and with RWA in the heads only, you need approximately 100 or more insects per head to warrant treatment.

There are several insecticides recommended for RWA control. Warrior 1E and Furandian 4F with methyl parathion have not been tested under Montana conditions. Products for ground application include: Dimethoate (Cygon), Lorsban 4E-SG, Pennacap-M, or Warrior 1E. Products for aerial application include: Di-Syston 8E, Dimethoate (Cygon), Furadan 4F with methyl parathion, Lorsban 4E-SG, Pennacap M, or Warrior.

## Cereal Leaf Beetle

Adult Cereal Leaf Beetle (CLB) are five millimeters (5/16 inch) long, with a metallic blue head and wing covers, a red neck, and yellow-orange legs. Newly laid eggs are elliptical, yellow, and about the size of a pin head; they reflect light well. Larvae are dark and slug-like in appearance. Their skin is yellow or yellowish brown and covered by a mass of slimy, dark, fecal material. Clusters of adult beetles overwinter in grass stems, grain stubble, cracks, and fenceposts. In the spring the adults emerge when maximum daily temperatures reach about 50°F. They immediately begin heavy feeding on wild grasses and then move to winter wheat and spring oats and barley if available. Adults prefer spring grains to winter wheat.

One female may lay up to 300 eggs, depositing each egg on its side, singly or in rows of three or four. Normally, eggs are placed on the upper leaf surface near the midrib of the leaf.

Most adult damage is easily outgrown by the plant. Larvae have a unique feeding pattern, they eat the upper layer of green cells, which create the green color and generate plant energy. They feed down the cuticle, staying between the leaf veins. When viewed closely, elongated slits are apparent following the veins. This feeding pattern gives the leaves a “frosted” appearance when viewed from a distance.

Eggs near hatching and larvae are the target of insecticide control and are monitored by plant inspection since thresholds are expressed as egg and larvae per plant or per stem/tiller. Examine 10 plants per location and select one location for every 10 acres of field. Count number of eggs and larvae per plant (small plants) or per stem/tiller (large plants) and get an average number of eggs and larvae per plant or stem/tiller.

Boot stage is a critical point in plant development and impact of CLB feeding damage can be felt on both yield and grain quality. **Before boot stage, the economic threshold is:** three eggs and larvae or more per stem/tiller. **The threshold is decreased at the boot stage to:** one larvae or more per flag leaf. These thresholds may need to be modified for malting quality barley because of its higher quality and high grain quality needs.

Insecticides available for CLB control are Lannate, Malathion, Sevin, Warrior, and Thiodan.

A detailed description of all insect pests, the economic thresholds for control, and treatment recommendations are available at the Extension Office, 256-2828

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